

Oconomowoc Watershed Protection Program

Waukesha County Stormwater
Conference

March 21, 2018

By: Mark Frye and Tom Steinbach
City of Oconomowoc

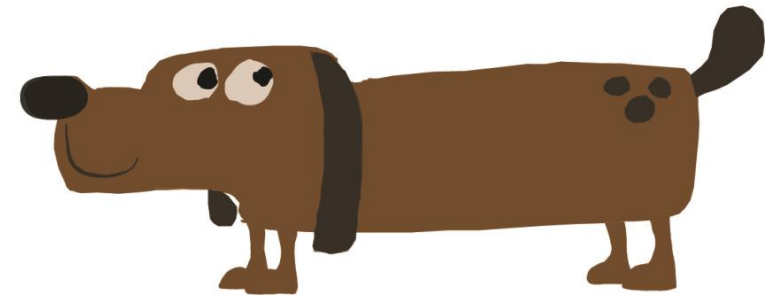


Relax, I'm not a PE...
so this should be interesting!



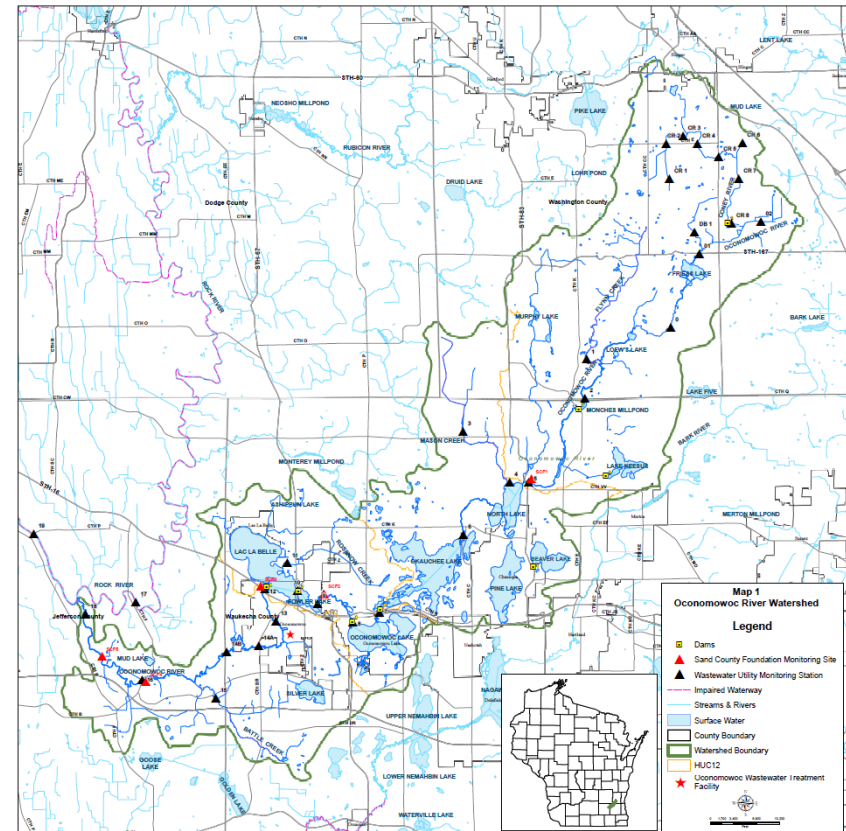
Pollutants may be generated in all areas of land use:

- Decomposing materials such as leaves
- Fertilizers
- Pesticides
- Heavy metals from vehicles, rooftops, and buildings
- Pet litter and animal waste



Why Adaptive Management?

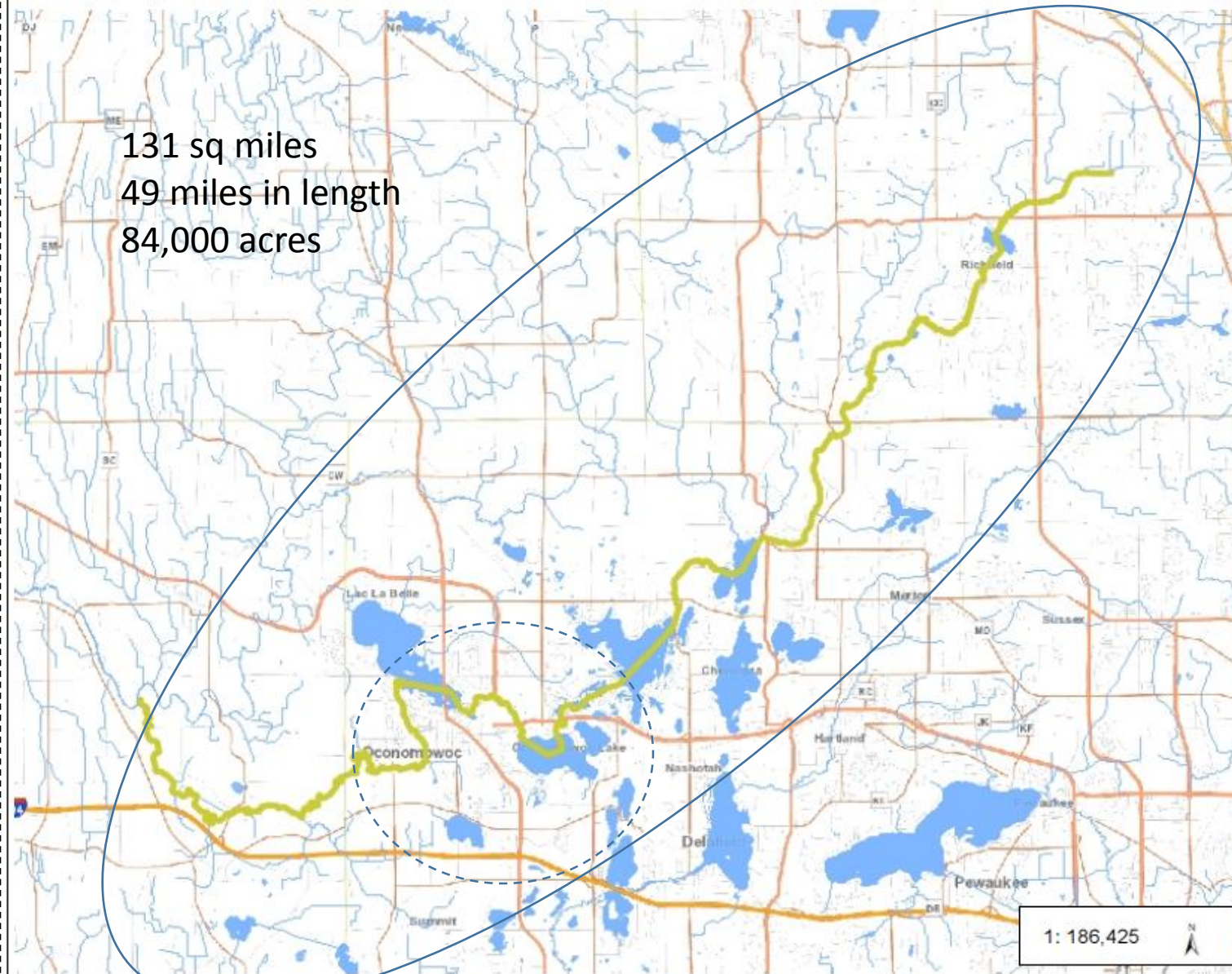
Adaptive Management is a process that allows us to address the source of pollutants in the watershed versus treating for their effects later.

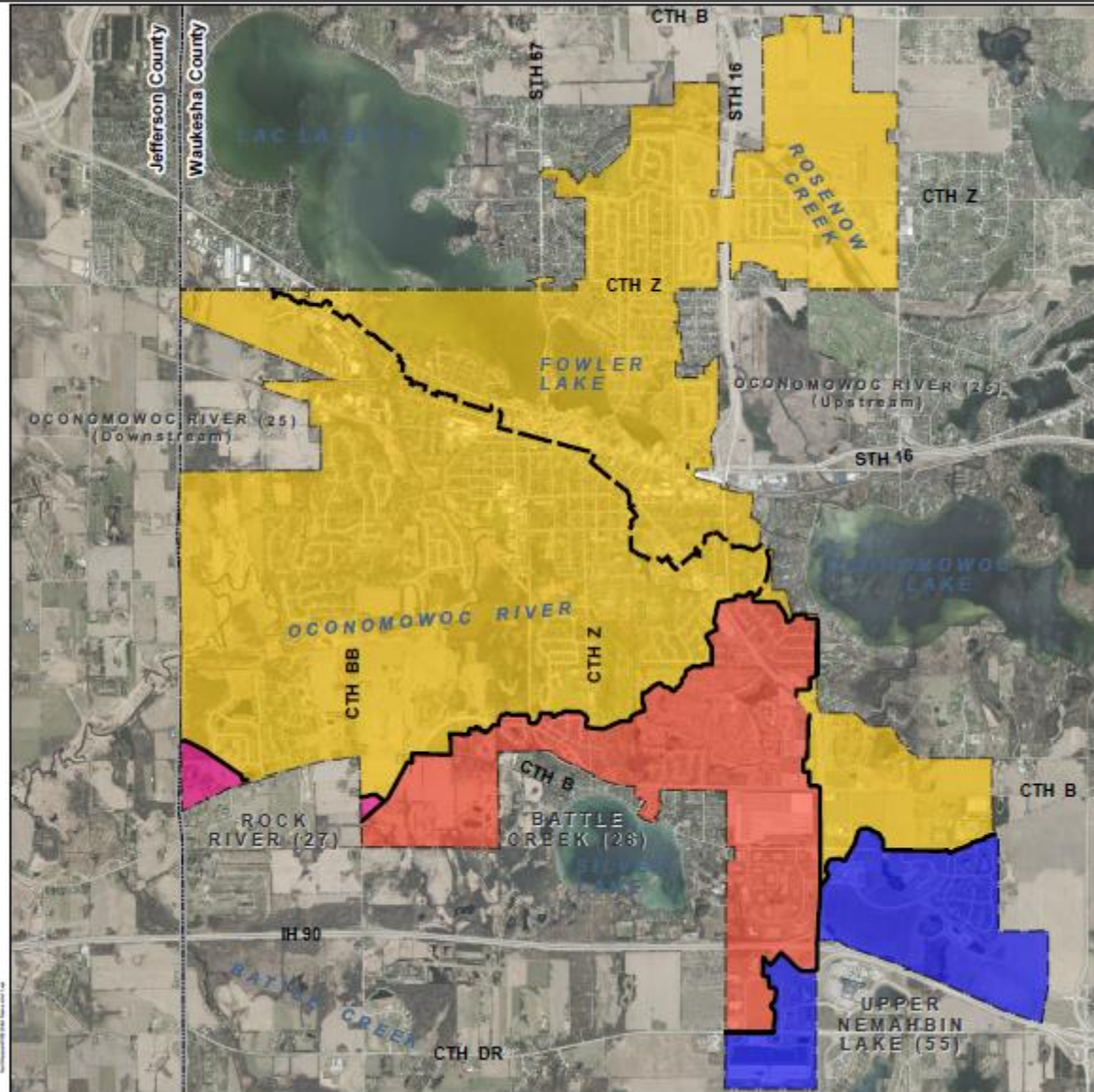




Surface Water Data Viewer Map

131 sq miles
49 miles in length
84,000 acres



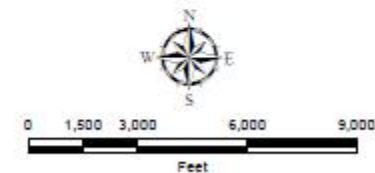


Life comes **NATURALLY** here

Storm Water Management System Planning Map Exhibit 1

Legend

- Oconomowoc River Reachshed (25)
- Battle Creek Reachshed (26)
- Rock River Reachshed (27)
- Upper Nemahbin Lake Reachshed (55)
- Reachshed Boundary
- Upstream/Downstream Reachshed Boundary
- Oconomowoc Boundary - City Limits



Ruekert • Mielke

Date: December, 2015

TMDL is Latin for I Hope You're Sitting Down

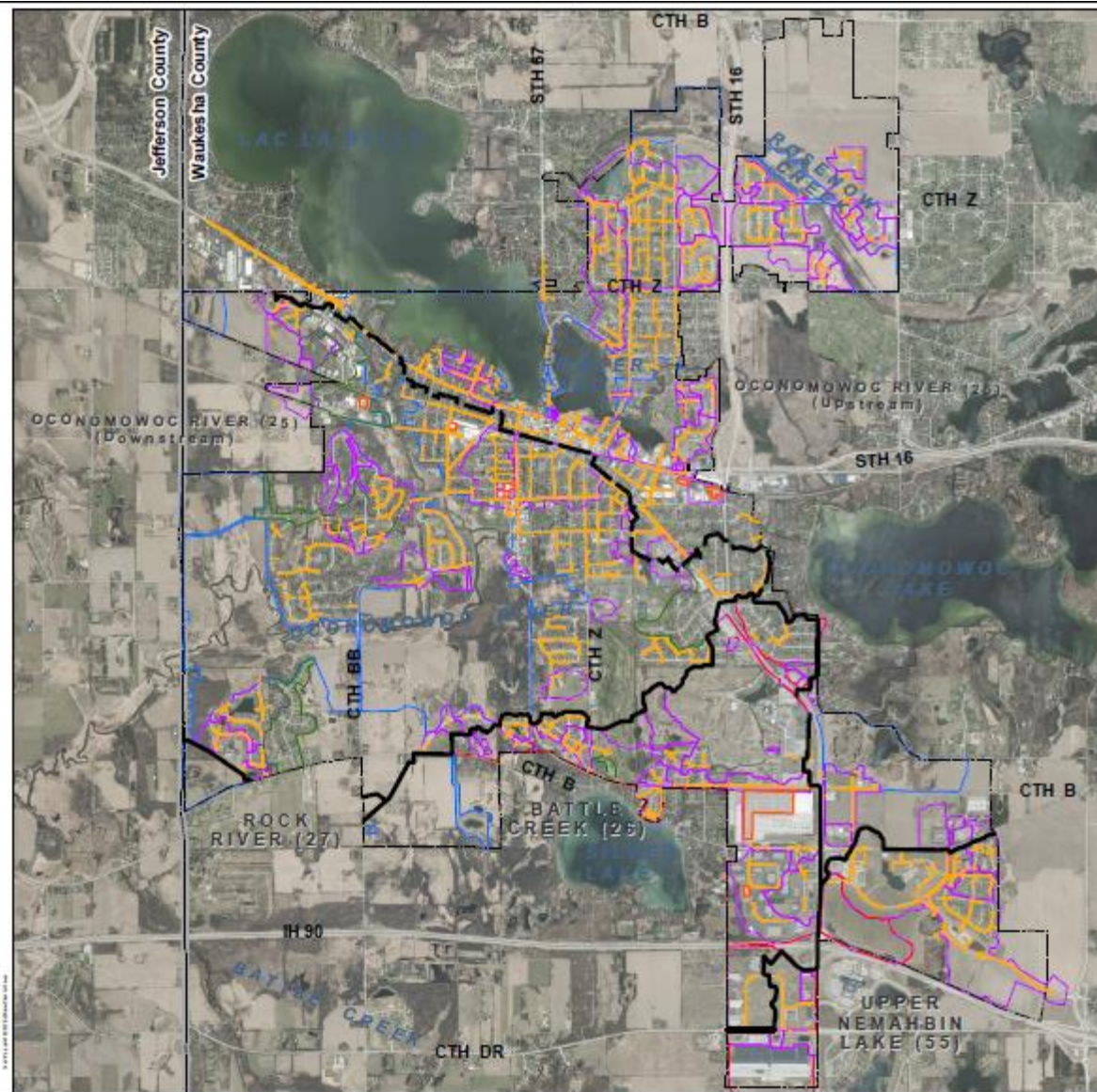


| Reachshed | Required Sediment Reduction From No Controls | Required Phosphorus Reduction From No Controls |
|---------------------------|--|--|
| Oconomowoc River (#25) | 59% | 74% |
| Battle Creek (#26) | 57% | 53% |
| Rock River (#27) | 40% | 27% |
| Upper Nemahbin Lake (#55) | 66% | 77% |

Table 2 – Summary of Annual Pollutant Loadings Under Existing Conditions

| Reachshed | Area (acres) | Total Suspended Solids (TSS) | | | | Total Phosphorus (P) | | | |
|-----------------------------------|--------------|------------------------------------|--------------------------------------|----------------------|---------------------------------|---|---|-----------------------------|--|
| | | TSS Loading – No Controls (Pounds) | TSS Loading – With Controls (Pounds) | Actual TSS Reduction | Required TSS Reduction Per TMDL | Phosphorus Loading – No Controls (Pounds) | Phosphorus Loading – With Controls (Pounds) | Actual Phosphorus Reduction | Required Phosphorus Reduction Per TMDL |
| Oconomowoc River #25 (Upstream) | 1,265 | 340,155 | 165,008 | 51.49% | 59% | 1,058 | 627 | 40.79% | 74% |
| Oconomowoc River #25 (Downstream) | 1,864 | 434,486 | 298,119 | 31.39% | 59% | 1,401 | 1,042 | 25.65% | 74% |
| Subtotal | 3,129 | 774,640 | 463,125 | 40.21% | 59% | 2,460 | 1,668 | 32.16% | 74% |
| Battle Creek (#26) | 932 | 308,261 | 66,816 | 78.32% | 57% | 750 | 307 | 59.07% | 53% |
| Rock River (#27) | 28 | 1,576 | 0 | 100% | 40% | 8.34 | 0 | 100% | 27% |
| Upper Nemahbin (#55) | 542 | 127,881 | 10,782 | 91.56% | 66% | 347 | 46 | 86.80% | 77% |
| Overall | 4630 | 1,212,158 | 540,723 | 55.39% | – | 3565 | 2021 | 43.31% | – |





Existing Storm Water Management System Exhibit 3

Legend

- Reachshed Boundary
- Upstream/Downstream Reachshed Boundary
- Storm Sewer
- Waters of the State Boundary
- WPDES
- Internally Drained Areas
- Grass Swales
- Water Quality Boundary
- Oconomowoc Boundary - City Limits

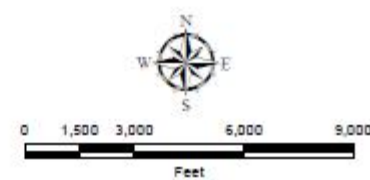


Table 3 – Summary of Recommended Alternative BMPs for Oconomowoc River Reachshed (#25)

| Control Measure | Total Suspended Solids (Pounds) | | Total Phosphorus (Pounds) | | Estimated Project Cost (Structural BMP) or Annual Cost (Sweeping) | Estimated 50 Year Present Worth | Cost Per Pound of Pollutant Removal | |
|---|---------------------------------|----------------------------|---------------------------|----------------------------|---|---------------------------------|-------------------------------------|------------|
| | Existing Land Use | Reduction from No Controls | Existing Land Use | Reduction from No Controls | | | Total Suspended Solids | Phosphorus |
| No Controls (Reachshed #25) | 774,640 | 0% | 2,460 | 0% | N/A | N/A | N/A | N/A |
| Existing Storm Water Controls | 311,515 | 40.21% | 791 | 32.16% | N/A | N/A | N/A | N/A |
| Street Sweeping Every 2 Weeks | 32,148 | 4.15% | 70 | 2.83% | \$185,400 | \$3,663,876 | \$113.97 | \$52,341 |
| Street Sweeping Every Week | 65,070 | 8.40% | 140 | 5.69% | \$370,800 | \$7,327,752 | \$112.61 | \$52,341 |
| PA-1 (Industrial Park) | 25,730 | 3.32% | 44 | 1.67% | \$557,090 | \$1,151,829 | \$45 | \$26,178 |
| PA-2&3 (Summit Avenue) | 5,544 | .72% | 9.5 | .39% | \$450,161 | \$774,768 | \$140 | \$81,555 |
| PA-3 (Hospital Pond) | 4,566 | .59% | 9 | .37% | \$236,218 | \$410,505 | \$90 | \$45,612 |
| PA-4 (Gas Station Pond) | 13,405 | 1.73% | 34 | 1.38% | \$665,366 | \$991,483 | \$74 | \$29,161 |
| PA-5 (Whitman Park Pond) | 17,643 | 2.28% | 46 | 1.87% | \$301,274 | \$528,622 | \$30 | \$11,492 |
| Thackeray Trail Alternative (Biofiltration) | 14,936 | 1.93% | 45 | 1.83% | \$2,792,463 | \$3,555,457 | \$238 | \$79,010 |
| PA-6 (Serve Facility Pond) | 16,325 | 2.11% | 38 | 1.55% | \$441,379 | \$725,057 | \$44 | \$19,080 |
| PA-7 (Forest Street Pond) | 20,383 | 2.63% | 53 | 2.15% | \$484,703 | \$846,995 | \$42 | \$15,981 |
| PA-8 (Champion Field Pond) | 17,187 | 2.22% | 34 | 1.38% | \$597,240 | \$1,036,083 | \$60 | \$30,473 |
| PA-9 (Church Wet Pond) | 4,675 | .60% | 11 | .45% | \$177,720 | \$285,092 | \$61 | \$25,918 |
| PA-9 (Church Biofiltration Device) | 4,646 | .60% | 12 | .49% | \$405,465 | \$592,045 | \$127 | \$49,337 |
| PA-10 (Riverside Park Wet Pond) | 4,709 | .61% | 13 | .53% | \$33,560 | \$62,285 | \$13 | \$4,791 |
| PA-10 (Riverside Park Biofiltration Device) | 5,789 | .75% | 18 | .73% | \$299,065 | \$447,425 | \$77 | \$24,857 |
| PA-11 (Armory Wet Pond) | 5,025 | .65% | 6 | .24% | \$488,000 | \$847,243 | \$169 | \$141,207 |
| PA-11 (Armory Biofiltration Device) | 3,793 | .49% | 6 | .24% | \$123,200 | \$192,734 | \$51 | \$32,122 |

Table 4 – Recommended Large Scale Storm Water Management Improvements

Oconomowoc River Reachshed (#25)

| Priority | Control Measure | Total Suspended Solids (Pounds) | | Total Phosphorus (Pounds) | | Estimated Project Cost (Structural BMP) or Annual Cost (Sweeping) | Estimated 50 Year Present Worth | Cost Per Pound of Pollutant Removal | |
|--|--|---------------------------------|----------------------------|---------------------------|----------------------------|---|---------------------------------|-------------------------------------|-----------------|
| | | Existing Land Use | Reduction from No Controls | Existing Land Use | Reduction from No Controls | | | Total Suspended Solids | Phosphorus |
| 1 | Water Quality Devices with Road Reconstruction | 0.40% Annually | | 0.25% Annually | | - | - | | |
| 2 | Promote Green Redevelopment | 0.40% Annually | | 0.25% Annually | | - | - | | |
| 3 | PA-10 (Riverside Park Wet Pond) | 4,709 | .61% | 13 | .53% | \$33,560 | \$62,285 | \$13 | \$4,791 |
| 4 | PA-7 (Forest Street Pond) | 20,383 | 2.63% | 53 | 2.15% | \$484,703 | \$846,995 | \$42 | \$15,981 |
| 5 | PA-1 (Industrial Park) | 25,730 | 3.32% | 44 | 1.67% | \$557,090 | \$1,151,829 | \$45 | \$26,178 |
| 6 | PA-8 (Champion Field Pond) | 17,187 | 2.22% | 34 | 1.38% | \$597,240 | \$1,036,083 | \$60 | \$30,473 |
| 7 | PA-4 (Gas Station Pond) | 13,405 | 1.73% | 34 | 1.38% | \$665,366 | \$991,483 | \$74 | \$29,161 |
| 8 | Street Sweeping Every Week | 65,070 | 8.40% | 140 | 5.69% | \$370,800 | \$7,327,752 | \$113 | \$52,341 |
| OCONOMOWOC RIVER REACHSHED TOTALS | | 152,681 | 19.71% | 327 | 13.30% | \$2,708,759.00 | \$11,416,427.00 | \$58 | \$26,488 |

Still Not Enough

The City of Oconomowoc is currently obtaining with our existing stormwater controls:

- 40.21% reduction in total suspended solids
- 32.16% reduction in phosphorous

Factor in potential improvements brings us to:

- 59% reduction in total suspended solids
- 45% reduction in phosphorous
- In compliance with the TMDL's requirement for total suspended solids
- Still significantly below the 74% phosphorous reduction goal !!!!!!!!!!!



No. 16 UMBC upset No. 1 Virginia

For the 136th time a No. 16 played a No. 1
For the first time, a No. 16 beat a No. 1.

Remember the date March 16, 2018

University of [Maryland-Baltimore County](#)
Defeated
University of [Virginia](#)

**With teamwork and a plan,
anything is possible !**





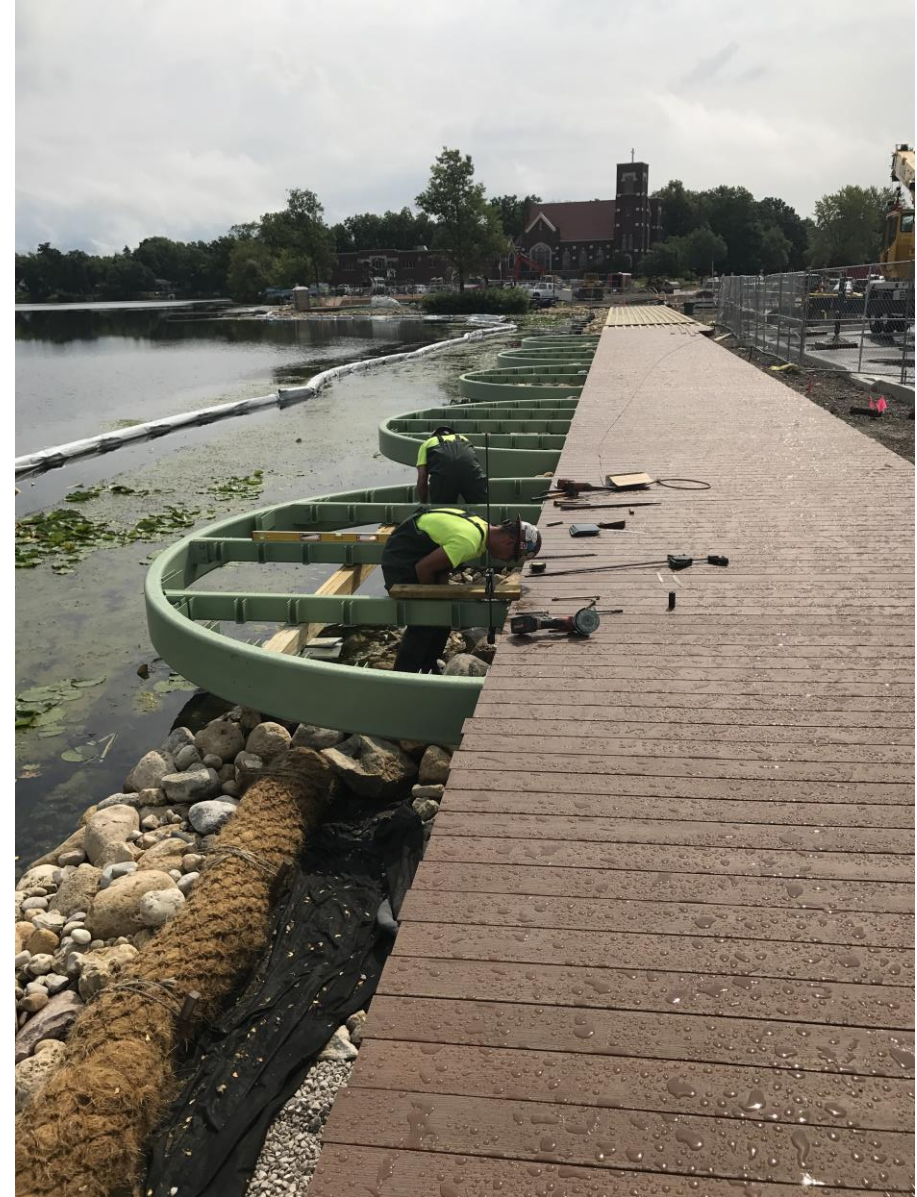
Every Little Bit Helps


Boardwalk Project



- Bio-retention from PL
- Extra large catch basins
- Surface debris capture

\$205,000



**Best Management Products**
The stormwater quality experts

53 Mt Archer Road | Lyme, CT 06371 | [Contact Us](#)
800-504-8008

[Google Custom Search](#)

■ ■ ■ The BMP SNOUT® stormwater quality improvement system, with accessories like the Bio-Skirt® and TrashScreen™, provide affordable structural solutions to help with today's Low Impact Development (LID) requirements.

The SNOUT, a vented catch basin hood or trap, offers reductions in gross pollutants such as floatables and trash, as well as free oils, and sediment. The Bio-Skirt more effectively captures and retains hydrocarbons and is treated with an anti-microbial to inhibit bacteria growth on the boom. The Stainless TrashScreen offers the highest level of gross pollutant removal including "Full Trash Capture" designation. BMP is also an OEM supplier of the SAFL Baffle. The SAFL Baffle is a great way to maximize suspended sediment removal. Verified T.S.S. reductions can now be shown using the SHSAM model.

Municipalities, state and federal agencies, the military, transportation and maritime industries, retailers and restaurants, as well as residential and commercial land developers seeking sustainability have successfully installed more than 65,000 SNOUT oil-water-debris separators as stormwater BMPs since 1999. All BMP products are made in the USA.

■ ■ ■ [Click Here for Drawings, Specs, and Pricing!](#)

BMP is in the news:

See the Waste and Water Management Issue of the Municipal Magazine which has a cover story about **BMP** and how municipalities are successfully using the SNOUT System to control stormwater pollution.

SNOUT Reviews:


Sustainable Stormwater.org gives the SNOUT **5 Stars**: [See SNOUT Product Review](#)


The American Society of Civil Engineers (ASCE) Buyers Guide Rates the SNOUT **4.8 out of 5 Stars**: [See ASCE Product Ratings](#)

See BMP at these upcoming events:


StormCon 2017, the North American Surface Water Conference and Expo, Bellevue, WA Aug. 27-31, 2017, Meydenbauer Convention Center

2017 Ohio Stormwater Conference, The Annual Ohio Regional Stormwater Conference, Sandusky, OH, May 10-12, Kalahari Resort and Conference Center

 **The Right Way to Design a Stormwater System**

 **How Do You Size One?**

 **Everything at a Glance**



What is a Snout? The "SNOUT": a hooded outlet cover that converts any sumped stormwater structure. [more](#)



SAFL Baffle

BMP is Proud to be an OEM Supplier of the SAFL Baffle from Upstream Technologies. We can now offer SHSAM verified T.S.S. Reductions of 80% or more. Contact us for more information.



JOEHAAS



Why Adaptive Management?

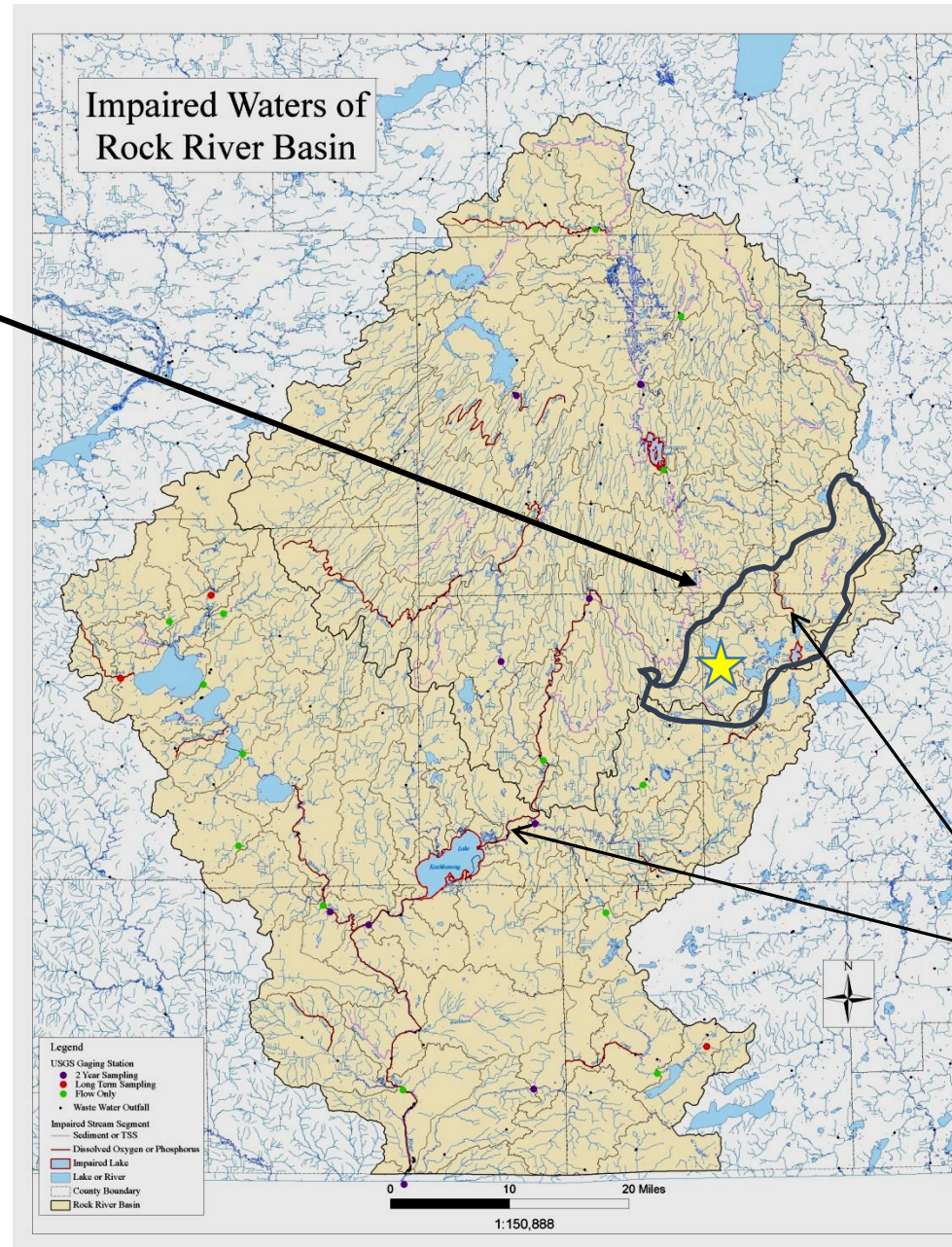
To meet our phosphorous TMDL goals in the City, we are adopting an adaptive management strategy in partnership with our Wastewater Utility. This approach will look at meeting our phosphorous goals on a watershed basis.





Oconomowoc River Watershed

- 49 Miles in length
- 17 Lakes
- 131 Square miles
- 84,000 acres



Impaired
reaches in red.

Options Evaluation 2013 - 2014



Brick and Mortar Projects
0.95 → 0.17 mg/l
By 2022
& Stormwater Management

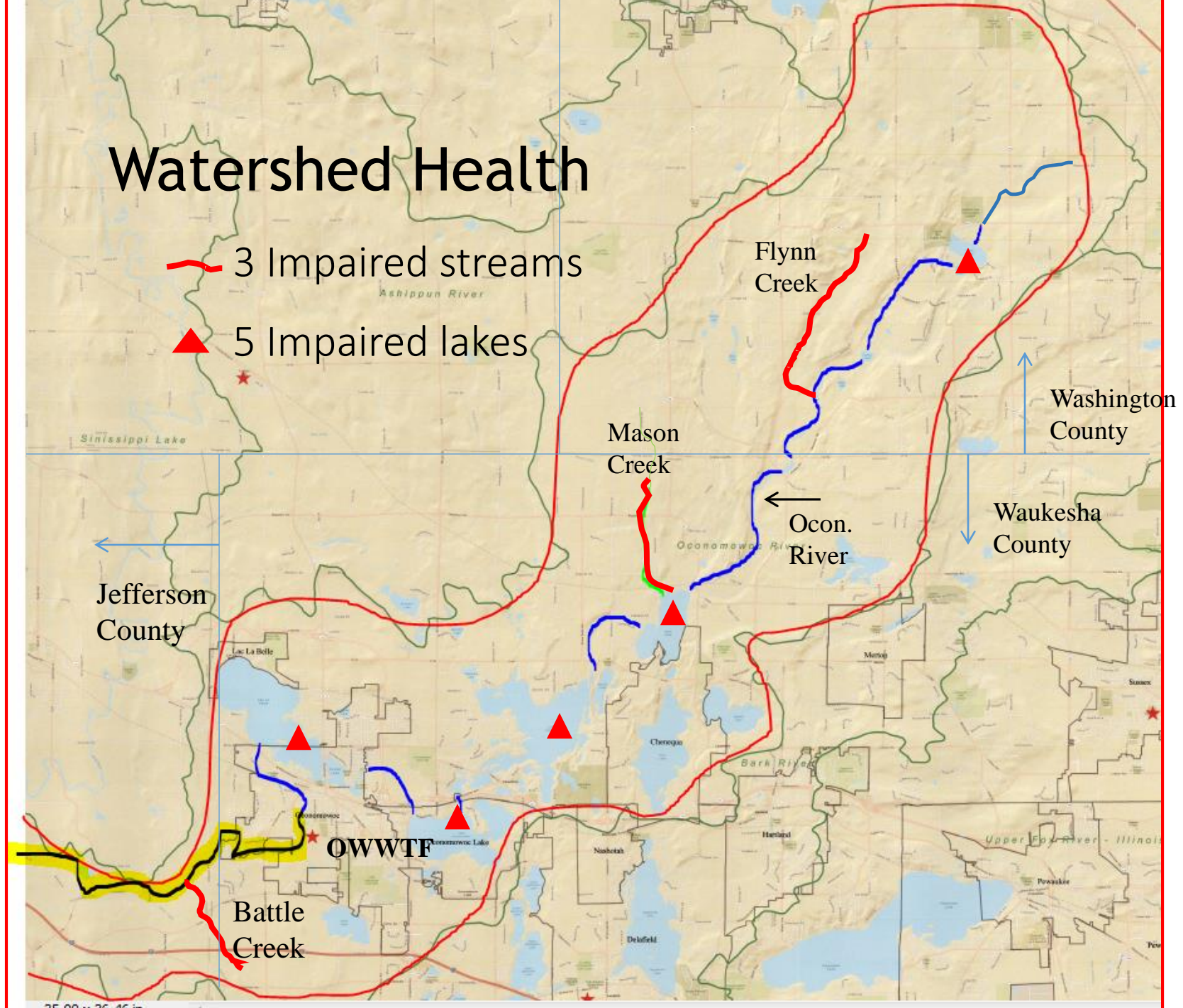
Impaired streams and lakes ? ... YES!



Watershed Health

3 Impaired streams

5 Impaired lakes





ADAPTIVE MANAGEMENT

A new program to encourage watershed based
pollutant reduction.

Oconomowoc received DNR approval on September
15, 2015.

The OWPP is born.



Factors in our success:

- Strong community support
- Strong partner base
- Connections to the right people
- Farmers leadership group
- Strong monitoring program
- BMP Financial support and flexibility
- PR – yellow objects in the air



Community Support:

LAKES !!! LAKES!!! LAKES!!!











Partners:

- Tall Pines Conservancy
- Ruekert and Mielke
- Clean Water Association
- Farmers For Lake Country
- Environmental Resource Consulting
- Pheasants Forever
- Volunteers



Connecting with the right people:

- Local politicians
- Farmers
- Specialists
- County LCDs
- NRCS Cons

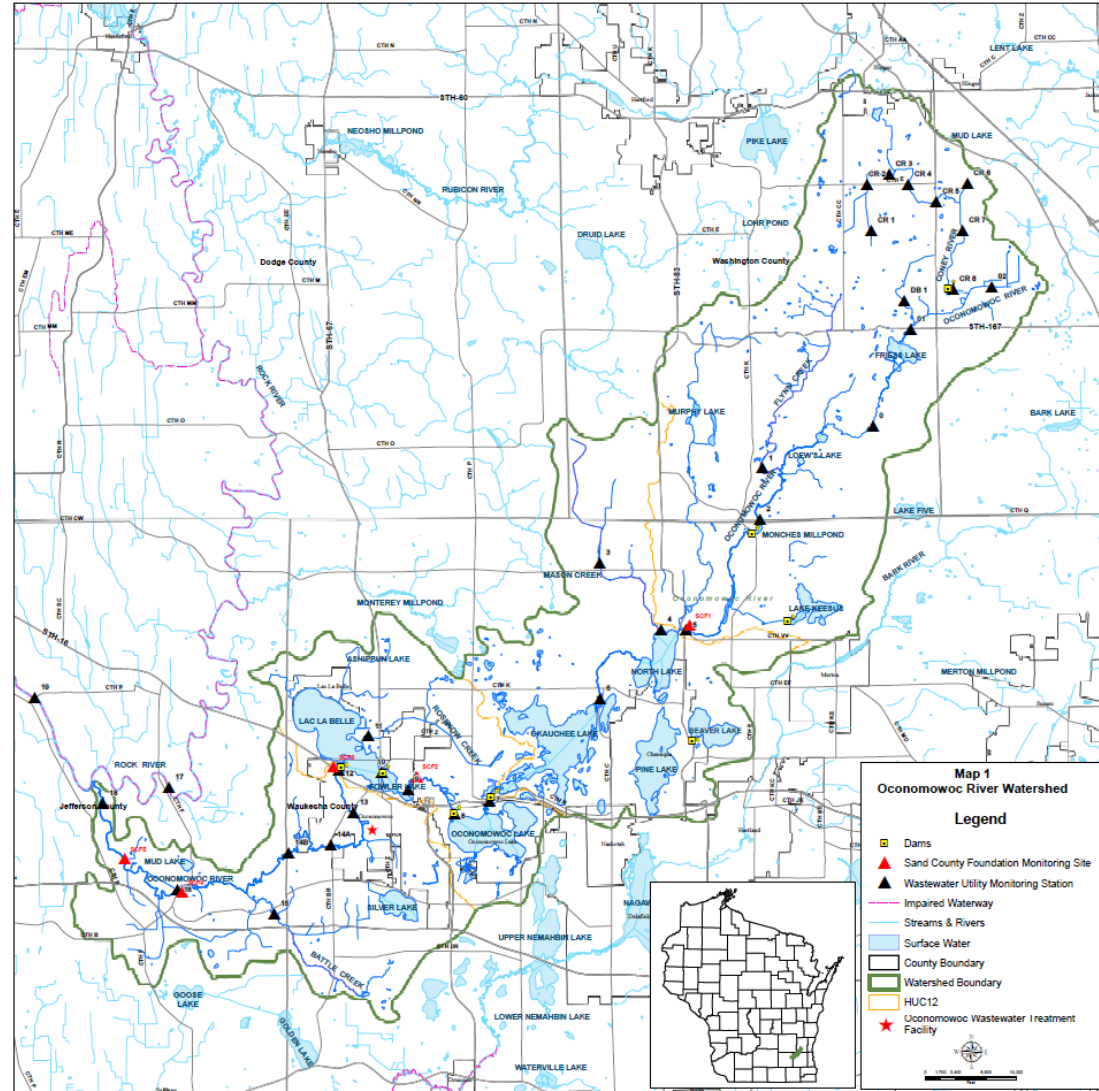


FFLC – Farmers For Lake Country

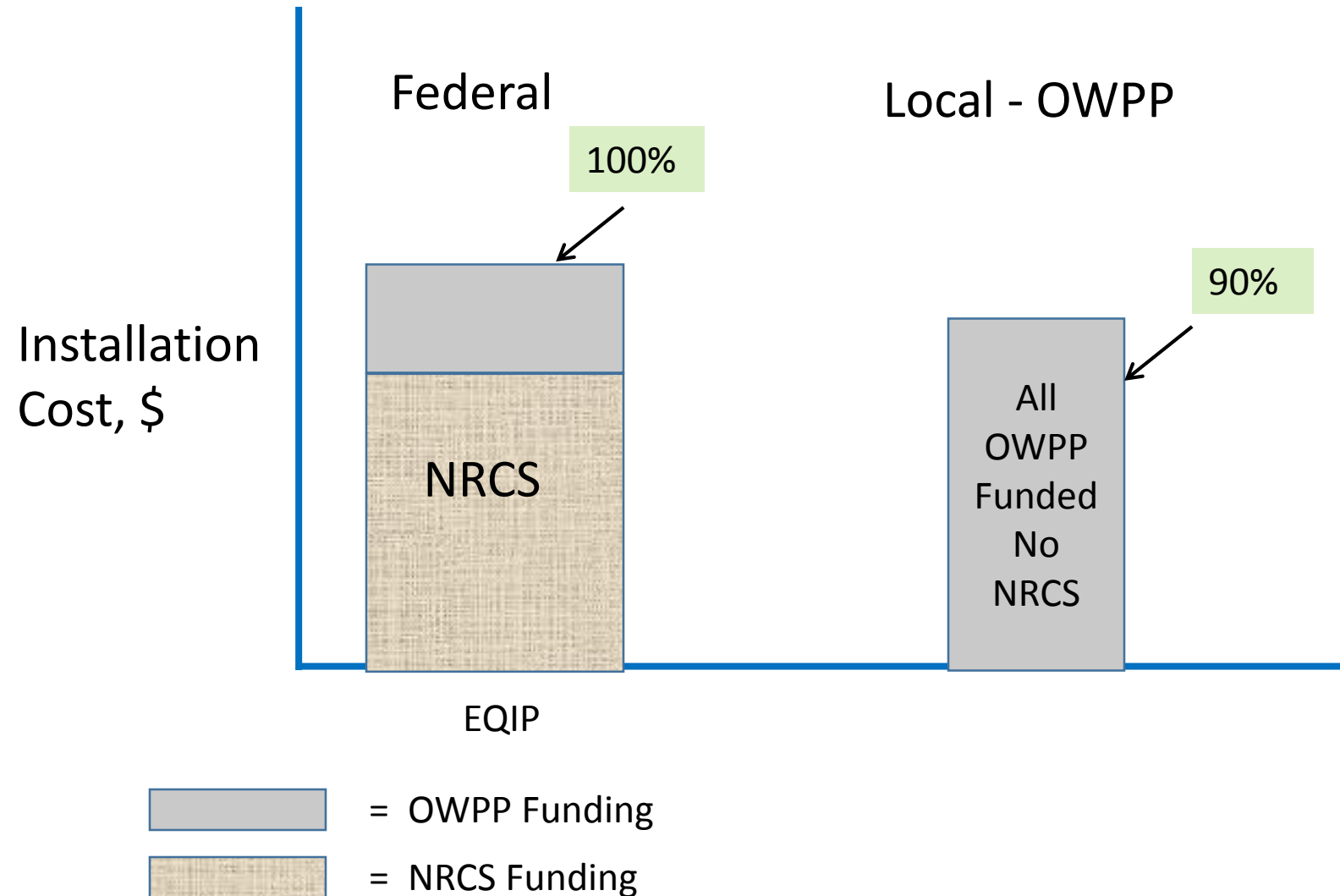


Monitoring:

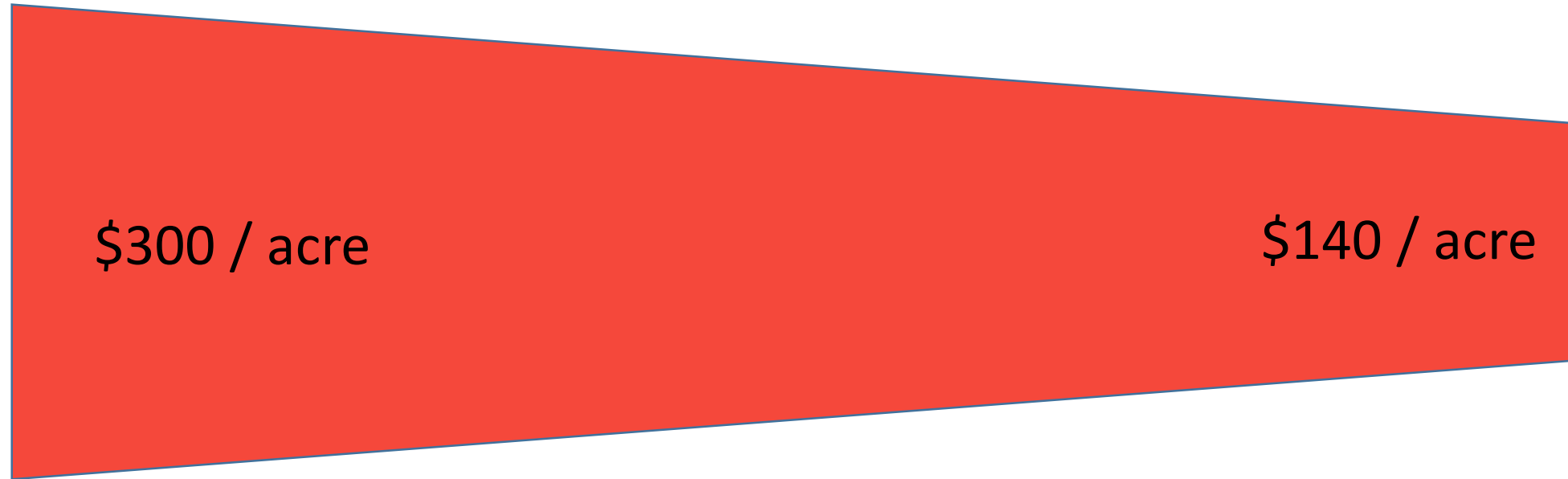
- ❖ Baseline
- ❖ Flow and comp/grab
- ❖ Event
- ❖ Mud Chasers
- ❖ Mason Creek Specific



BMP Funding Sources and Options



Rent Offset – Tiered



- Proximity to Confluence, Waters edge, or Hot Spots
- Priority Resource Concern
- Slope to pour point
- Project size

Flexibility !!!!!



Aerial Seeding Project – Great Conservation AND PR!!







Take of seeds ?

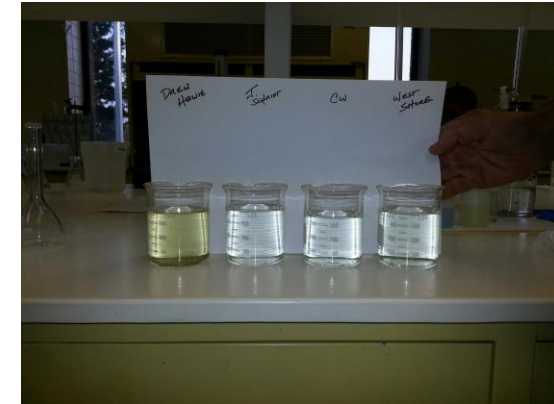


Challenges:

- Reed Canary Grass – Figuring it out
- The Feisty Few
- May & June – Difficult



Reed Canary Grass





The Feisty Few



Mason Creek at Hwy CW





Fertilizer Paddies Anyone?



Ag & Stormwater Project Summary

OWPP Project Summary - Completed as of December 21, 2017

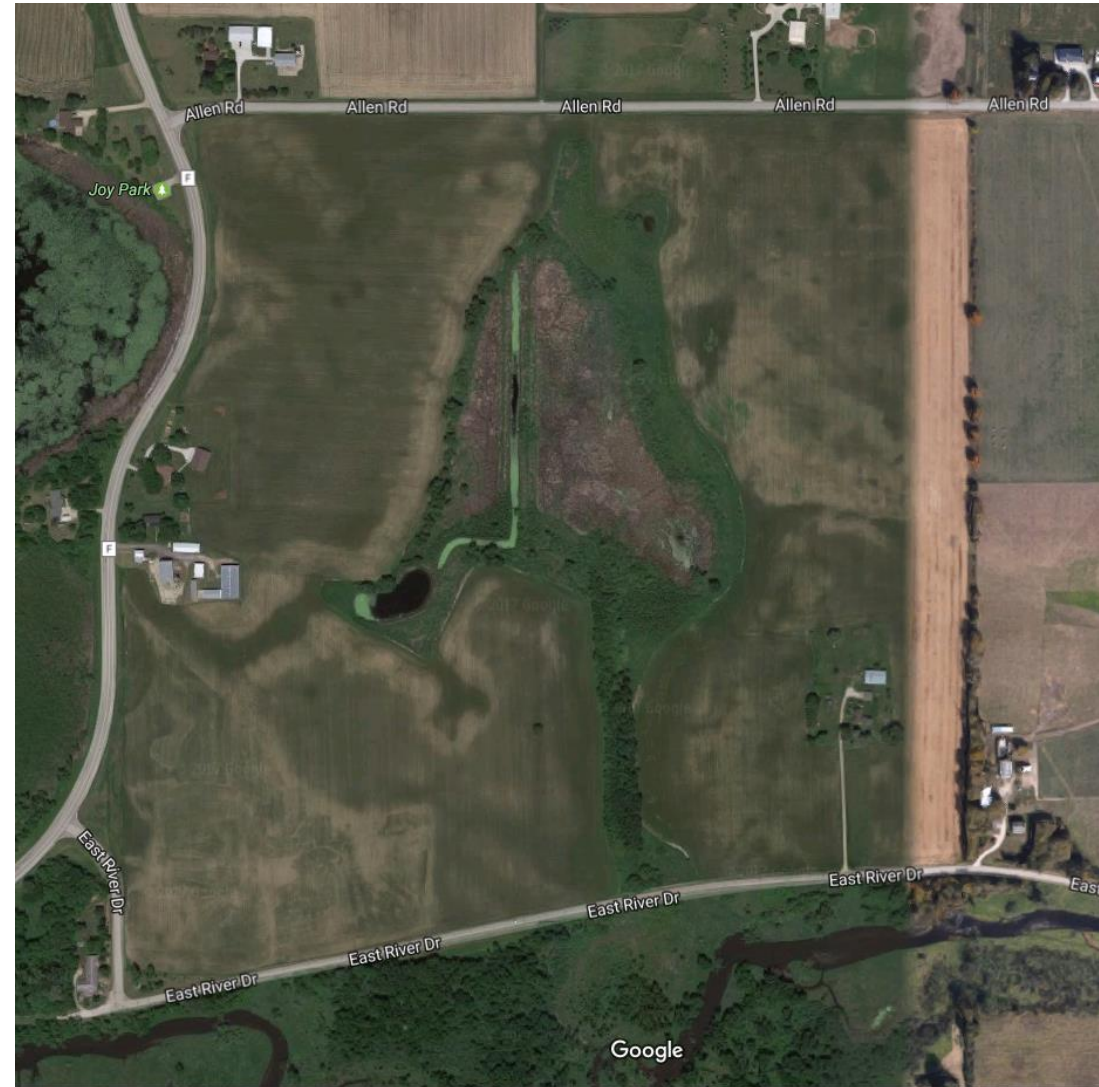
| Project type | Projects | Acres | Lin. Feet |
|------------------------|----------|-------|-----------|
| Seasonal Cover | 6 | 690 | |
| Conservation Cover | 3 | 161 | |
| Pollinator Cover | 3 | 43 | |
| Aerial Cover | 20 | 990 | |
| Animal control | 2 | | 1430 |
| Scrapes | 2 | 0.25 | |
| Filter strips | 2 | 12.5 | |
| Buffer strips | 2 | 5.9 | |
| Wetland restoration | 1 | 0.8 | |
| Sedimentation Basin | 1 | 0.1 | |
| Streambank Restoration | 3 | | 1500 |
| Re-Forestation | 1 | 10 | |
| Storm Water Treatment | 2 | 13 | |
| Totals | 48 | 1927 | 2930 |



A few examples of BMP projects.



Large acreage project.



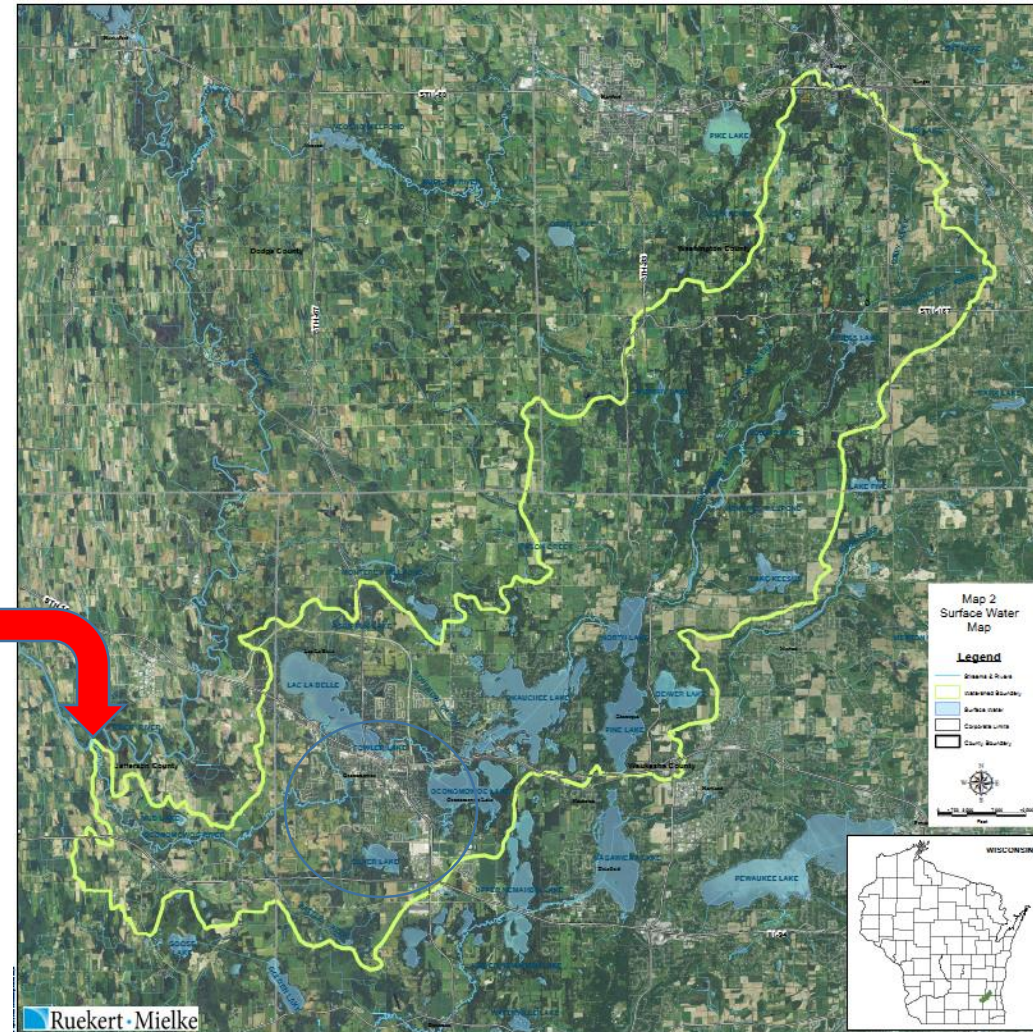


Our Ultimate Goal

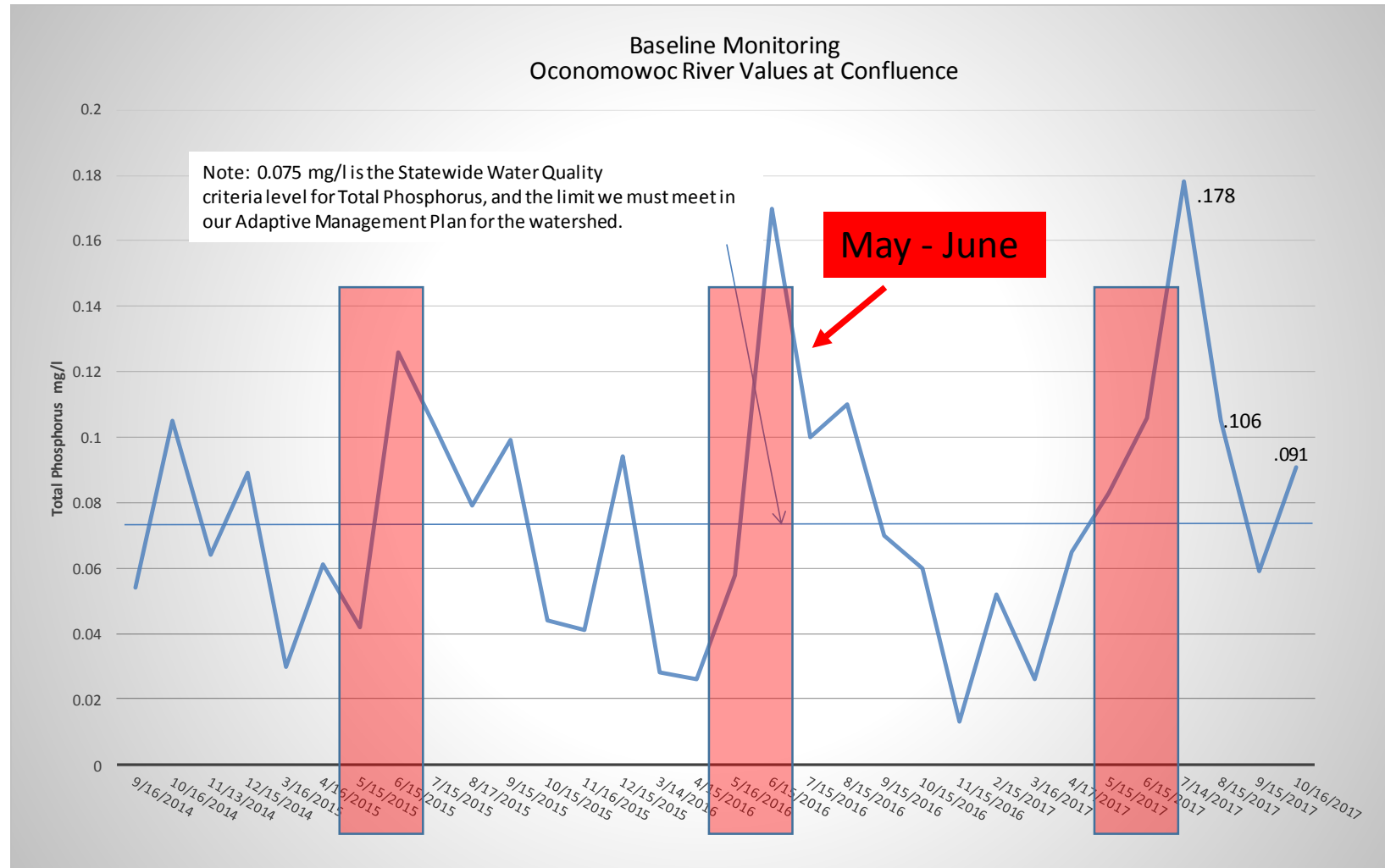
15 year - ~2031

Meet the confluence
Total Phosphorus
target of 0.075 mg/l.

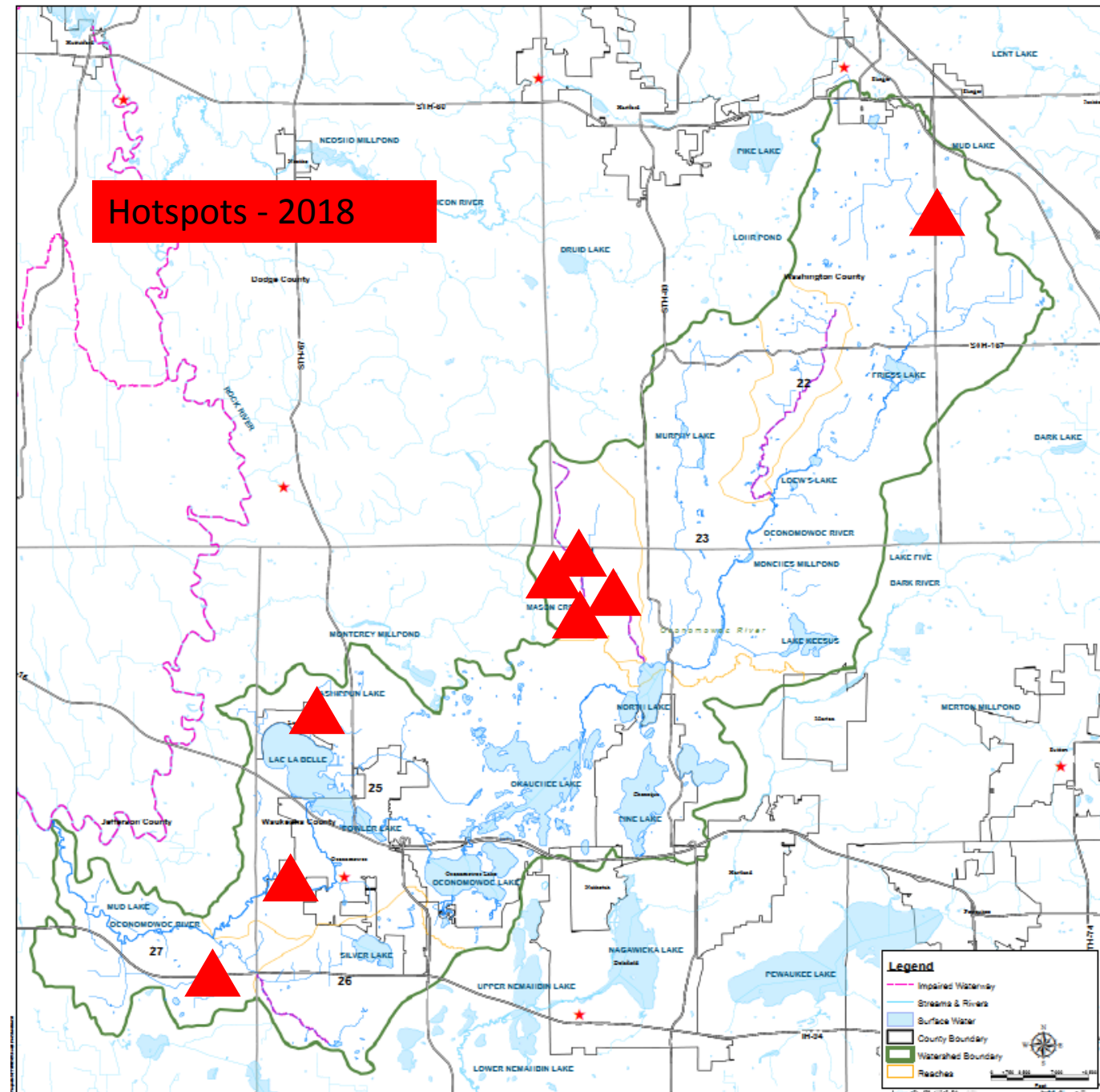
Present level = 0.090
mg/l



Confluence Total Phosphorus



2018 and Beyond: Re-Focus



2018.....



- Partner Engagement
- Lake Management – step up involvement – lakeshore property and private septic system review.
- Storm water project initiatives
- DATCP Grant for Nutrient Management Plan education
- Tall Pines Conservancy – RCPP – Conservation Easements

The Passion Factor !!!!!







Questions ??

*Visit us at:
<http://oconomowocwatershed.com>*

*Mark Frye
262-569-2184*

*Tom Steinbach
414-531-7006*